Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Rural Digital Opportunity Fund	)	WC Docket No. 19-126
	)	
Connect America Fund	)	WC Docket No. 10-90

COMMENTS OF VIASAT, INC.

Christopher Murphy
Associate General Counsel,
Regulatory Affairs
VIASAT, INC.
6155 El Camino Real
Carlsbad, CA 92009

John P. Janka
Matthew T. Murchison
LATHAM & WATKINS LLP
555 Eleventh Street, NW
Suite 1000
Washington, DC 20004

September 20, 2019

TABLE OF CONTENTS

Page

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Rural Digital Opportunity Fund	)	WC Docket No. 19-126
	)	
Connect America Fund	)	WC Docket No. 10-90

COMMENTS OF VIASAT, INC.

Viasat, Inc. ("Viasat") submits these comments in response to the Notice of Proposed Rulemaking ("NPRM") released on August 2, 2019 in the above-captioned proceedings.[1]

INTRODUCTION AND SUMMARY

Viasat welcomes the opportunity to comment on the Commission's NPRM regarding the establishment of a new Rural Digital Opportunity Fund ("RDOF"). As the NPRM explains, the proposed RDOF program aims "to build on the success of the CAF Phase II auction" by "commit[ting] at least $20.4 billion over the next decade to support high-speed broadband networks in rural America."[2] As the Commission recognizes, the "success of the CAF Phase II auction" was attributable to the Commission's ability to "secure[] higher quality services for consumers at a lower cost to the Universal Service Fund" through a competitive bidding process that "encourage[d] intermodal competition."[3]

Viasat is proud to have been a major contributor to the success of that auction and significant force in driving down the cost of support in areas across the country and extending new broadband offerings to over 190,000 locations. Viasat participated despite the substantial

---

1 *See Rural Digital Opportunity Fund; Connect America Fund*, WC Docket Nos. 19-126, 10-90, Notice of Proposed Rulemaking, FCC 19-77 (rel. Aug. 2, 2019) ("NPRM").

2 *Id.* ¶ 3.

3 *Id.*

handicaps imposed on satellite broadband providers in that auction—including a severe 25 percent penalty applied to the bids of geosynchronous-orbit ("GSO") satellite providers because of the small latency inherent in the round trip transmission of a radiofrequency signal to the satellite and back to earth. As Viasat explained at the time, despite the requirement that GSO providers satisfy a substitute performance metric as to voice service, GSO satellite providers were unreasonably singled out for this one metric that affects at most an inconsequential portion of overall broadband service. Meanwhile, other technologies were not subject to any penalty associated with their failure to satisfy critical performance metrics that actually affect virtually all broadband services—and thus the overall end user experience. The Commission also declined to allow GSO providers to qualify for lower latency tiers through effective hybrid offerings that would route all latency-sensitive traffic over terrestrial networks that satisfied the applicable latency requirement.

Viasat was provisionally awarded over 190,000 locations in 20 states, for just over $120 million of support to be paid over a 10-year term. Viasat's winning bids covered approximately 27 percent of the locations to be awarded in the auction for approximately 8 percent of the total funding awarded—a compelling illustration of the critical role satellite providers have played and will continue to play in ensuring the widespread availability of robust broadband service in a cost-effective manner, and in driving down cost of broadband subsidies for the consumers who fund those subsidies through their contributions to the USF. Moreover, as discussed further below, Viasat was *the only bidder* in many areas where it provisionally won support in the CAF Phase II auction—meaning that those areas otherwise likely would have continued to have been left behind in terms of CAF-supported services, and underscoring the essential role of satellite broadband services in bridging the digital divide in this country.

Notably, as the Commission is aware, satellite providers had been excluded from CAF support opportunities prior to the CAF Phase II auction—an approach that was unsupportable at the time, and is even more indefensible given Viasat's crucial role in the CAF Phase II auction. In implementing the CAF program, the Commission initially granted incumbent local exchange carriers ("ILECs") that were receiving USF support a "right of first refusal," allowing them to elect to receive future CAF funding in exchange for committing to offer service at 10/1 Mbps to households that otherwise were deemed unserved by a competitor (a definition that excluded satellite broadband service). These carriers accepted approximately $1.5 billion annually over a six-year period to serve approximately 3.6 million locations, but left over a $1 billion in total support on the table for locations that they declined to serve. For most of these locations left behind by ILECs, the Commission established the CAF Phase II auction, but again initially proposed a framework that would exclude GSO satellite services from participation.[4] The Commission ultimately decided to enable satellite services to participate in the auction—albeit at a significant disadvantage due to the 25 percent latency penalty described above and the inability to utilize effective hybrid solutions.

Given Viasat's successful participation in the CAF Phase II auction—and its critical role in extending cost-effective service offerings that meet Commission quality standards while tempering others' bids—the rational next step for the Commission in establishing the RDOF program would be to further expand opportunities for satellite providers to bid for support and help bridge the digital divide in a cost-effective manner. Without good reason, however, the NPRM proposes moving in the opposite direction.

---

[4] *See Connect America Fund*, Report and Order, Further Notice of Proposed Rulemaking, *et al.*, 29 FCC Rcd 7051 ¶ 149 (2014) (proposing to require all support recipients to meet latency requirements that GSO satellite providers cannot satisfy).

Rather than eliminating or reducing the latency-related bidding penalty in order to foster intermodal competition, the NPRM proposes significantly *increasing* that penalty from 25 percent to 40 percent, and possibly higher.[5] As discussed below, this proposal is unsustainable as a policy matter, as it would effectively preclude meaningful participation by GSO satellite providers and seriously undermine the Commission's goals of expanding broadband access, stoking competition, and driving down support costs. Indeed, as explained in the attached economic report by Stanford Professor Dr. Paul Milgrom and his team at Auctionomics, a quantitative analysis of the CAF Phase II auction confirms the harms that would result from pursuing the approach laid out in the RDOF NPRM.[6] Moreover, if adopted, such an approach may well be struck down as unlawful by a reviewing court; not only does a 40 percent penalty lack any conceivable evidentiary support or rational basis, but it also flouts principles of competitive and technological neutrality that courts have said must inform the Commission's support programs and that the Commission itself recognizes as a guiding principle in its own decisions. As discussed below, the Commission should instead be seeking to *reduce* the penalty on latency going forward to increase opportunities for coverage—and the realities of actual Internet application usage support, at most, only a 5 percent latency-based weight.

Additionally, the Commission should consider other ways to ensure that the RDOF auction generates maximally efficient outcomes. To begin with, the Commission should provide additional flexibility to satellite providers and others that may seek to use "hybrid" offerings to meet their support obligations, rather than retaining the rigid limitations that have made hybrid

---

5 *See* NPRM ¶ 25.

6 *See* Dr. Paul Milgrom and Dr. Ilya Segal, "Lessons from the CAF II Auction for the RDOF Auction" (Sep. 20, 2019) ("Milgrom/Auctionomics Report"), attached as Exhibit A.

offerings impractical for GSO providers to propose in prior CAF support phases. The NPRM proposes to continue requiring that hybrid offerings satisfy the latency requirements of a particular support tier at least 95 percent of the time in order to qualify for that tier, or else be relegated to a lower tier with substantially higher bidding penalties. But this binary, draconian approach discourages competitive bidding through hybrid offerings—particularly in the case of GSO providers, which are precluded from using terrestrial technologies effectively to support the small portion of broadband applications that may be deemed "latency-sensitive." The Commission thus should pursue reforms that would promote more effective hybrid bidding—such as a rule stating that, if a provider meets a Mean Opinion Score ("MOS") of four for voice service and routes other latency-sensitive traffic over low-latency links that provide 100 ms of latency 95 percent of the time, it is deemed to qualify for the low latency tier when bidding. Additional reforms discussed below, including measures aimed at expanding coverage by supported services and increasing transparency in the bidding process, likewise would help further promote efficiency for the Commission and bidders alike.

Viasat is committed to working closely with the Commission to ensure that the RDOF auction is an even greater success than the CAF Phase II auction. But the current proposals—which would prevent meaningful participation by GSO satellite services and technologies either in their own right or as part of a hybrid offering—threaten to undermine the auction before it even begins, and also present serious legal and policy concerns. The Commission thus should promptly begin reevaluating these proposals and exploring alternative, evidence-driven approaches that will more effectively promote the Commission's goals and pass legal muster.

DISCUSSION

I. THE PROPOSAL TO SUBSTANTIALLY INCREASE THE LATENCY-RELATED PENALTY IS NOT SUSTAINABLE AS A POLICY MATTER

As an initial matter, there is no question that the NPRM's proposal to impose a 40 percent penalty on so-called "high-latency" bids would effectively preclude meaningful participation by GSO satellite providers in the RDOF auction. Viasat's experience bidding in the CAF Phase II auction gives it unique insight into the likely effects of such an approach. There, Viasat was subject to a 25 percent latency penalty (on top of other speed-related weights) and was only barely able to bid successfully in the areas where it was ultimately awarded provisional support. If the latency penalty in the CAF Phase II auction had been 40 percent instead of 25 percent, Viasat would not have been in a position to bid successfully for *any* locations. This assessment is confirmed by an economic report prepared by Stanford Professor Dr. Paul Milgrom and his team at Auctionomics (appended to these comments).[7] The Milgrom/Auctionomics Report undertakes a quantitative analysis and finds that, if the latency penalty had been even 10 percent higher in the CAF Phase II action, "Viasat's support would have been reduced to zero before round 12, preventing Viasat from winning any areas or to offering any competition to terrestrial providers."[8] Plainly, increasing the latency penalty by an even *greater* degree in the RDOF auction would give Viasat and other GSO satellite providers virtually no chance of participating successfully.

The lack of meaningful participation by GSO satellite providers would seriously undermine the RDOF auction as a whole. Even in areas where no other provider bids, GSO

---

7 *See* Milgrom/Auctionomics Report at 2-4.

8 *Id.* at 3.

satellite providers still likely would not be in a position to bid successfully (i.e., survive until the clearing round), thus leaving unserved large numbers of the locations intended to be served by the RDOF. Again, Viasat's experience in the CAF Phase II auction is instructive. There, Viasat was frequently the *only* bidder in areas where it ultimately won provisional support. Thus, any auction rule that forecloses meaningful participation by Viasat and other GSO satellite providers in the RDOF (such as increasing the latency penalty from 25 percent to 40 percent) would directly contravene the Commission's goal of expanding universal service.

The Milgrom/Auctionomics Report confirms this conclusion. The Report includes a counterfactual analysis of what would have occurred in the CAF Phase II auction had Viasat not participated, and the analysis shows a significant drop in the number of locations covered by a supported service.[9] According to the Report, absent participation by Viasat, "the auction would still have cleared in round 12, albeit at a price point of 79.5% instead of 78.35%," and "[t]his higher clearing price point would have allowed terrestrial providers to cover at most 43 additional CBGs" beyond those that were provisionally awarded to terrestrial providers in the actual auction.[10] Those CBGs contain only "2,548 locations, which is just *0.48%* of the total of 522,581 locations covered by terrestrial providers in the auction."[11] By contrast, Viasat's participation led to a "*36% coverage increase*" for the auction as a whole—enabling the CAF program to cover far more locations than it could have by relying on terrestrial providers alone.[12] Put another way, "Viasat covered 75 new locations for each location whose terrestrial coverage it

---

9 *See id.* at 2.

10 *Id.*

11 *Id.* (emphasis added).

12 *Id.* (emphasis added).

displaced."[13] Thus, "the effect of Viasat's participation was to supply broadband service to a large number of locations that otherwise would have been left unserved."[14] If the Commission were to design the RDOF program in a manner that precludes such beneficial participation by GSO satellite providers (such as by imposing a 40 percent latency penalty), it would severely undermine the Commission's efforts to bridge the digital divide in this country.

Moreover, in areas where one or more terrestrial providers may bid for support, a GSO satellite provider subject to a 40 percent latency penalty could not effectively discipline the bids of these other providers. In the CAF Phase II auction, Viasat's bids helped drive down the support cost in many areas where it was not the ultimate winner, thus playing a critical role in maximizing the efficiency and cost-effectiveness of the Commission's support mechanism. Indeed, the Milgrom/Auctionomics Report finds that, if Viasat had not been able to participate effectively in that auction, the result would have been "a much higher per-location subsidy" in areas where terrestrial providers ultimately won support.[15] The Report analyzes the CAF Phase II bid data and determines that, absent participation by Viasat, "clearing would have still occurred in round 12 with essentially the same assigned support, and the auction would have proceeded to reduce the cost in subsequent rounds in exactly the same way."[16] Thus, not only did Viasat's participation greatly expand the number of locations served; it also did so without materially increasing the total support cost for the entire CAF II auction, resulting in a significantly lower average cost per location. In other words, "the support awarded to Viasat

---

13 *Id.*

14 *Id.*

15 *Id.* at 4.

16 *Id.* at 2 (footnote omitted).

was offset by the reduction in the support awarded to terrestrial bidders."[17] Additionally, in comparing the actual auction results to the counterfactual scenario in which Viasat could not participate meaningfully, the Milgrom/Auctionomics Report finds that "only 8% of th[e] amount [ultimately awarded to Viasat] (namely, $990K) was demanded by terrestrial providers to cover the 43 additional CBGs they bid for, with the remaining 92% coming out of the rents demanded by monopolistic terrestrial bidders for the locations they ended up covering anyway."[18]

The upshot of this economic analysis is clear. The effect of Viasat's ability to participate in the CAF Phase II auction "was to supply broadband service to a large number of locations that otherwise would have been left unserved, while providing competition to monopolistic terrestrial providers and reducing their rents," and "at zero net cost to the FCC."[19] Meanwhile, "[m]aking the latency penalty more draconian than that used in the CAF II auction will create a very high risk if not certainty of eliminating any potential competition from GSO satellite providers, resulting in significantly reduced coverage and a much higher per-location subsidy."[20] Indeed, the Milgrom/Auctionomics Report finds that "reducing the latency penalty" from the 25 percent weight applied in the CAF Phase II auction "is likely to increase overall coverage, yield only a small reduction in terrestrial coverage, and reduce the auction's overall cost due to more robust competition."[21] The Report's quantitative analysis thus indicates that the Commission's goals of

---

17 *Id.*

18 *Id.* (footnotes omitted)

19 *Id.*

20 *Id.* at 4.

21 *Id.*; *see also id.* at 3 (analyzing the "counterfactual in which Viasat's penalty is 8% lower (corresponding to reducing the latency weight to 17% while keeping the tier service weights unchanged)," and finding that "the likely outcome of the lower latency penalty would have been a 16% increase in total coverage" and "a $17M reduction in the aggregate cost").

serving more locations at a lower cost would be best served by adopting a *lower* latency penalty for the RDOF auction than the one applied in the CAF Phase II auction—and certainly not by increasing the penalty. Indeed, as discussed further below, the facts of actual Internet usage support, at most, only a 5 percent latency-related weight.[22]

Finally, an approach that either excludes or severely limits participation by GSO satellite providers also would seriously distort competition in the broadband marketplace. Historically, the Commission has ignored the presence of satellite providers when determining whether a given geographic area is "unserved" for support eligibility purposes.[23] Thus, even in areas where a satellite provider is offering 25/3 Mbps broadband service, the Commission may determine that the area is "unserved" if no terrestrial provider is present—and the NPRM offers no indication that the Commission intends to alter this approach for the RDOF auction. As the Commission is well aware, a subsidized provider in an area where one or more unsubsidized providers are present gains a significant price advantage, which, in turn, reduces incentives for those existing unsubsidized competitors to invest or expand service in subsidized markets.[24] For example, the

---

22 *See infra* at 17-18.

23 *See, e.g., Connect America Fund*, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663 ¶ 146 n. 231 (2011) ("*USF/ICC Transformation Order*") ("The term 'unserved by fixed broadband' for the purpose of CAF Phase I includes areas not identified by the National Broadband Map as served by at least one of the following technologies: asymmetric xDSL, symmetric xDSL; other copper wireline; cable modem - DOCSIS 3.0; cable modem - other; electric power line; terrestrial fixed wireless - unlicensed; and terrestrial fixed wireless - license."); *id.* ¶ 149 (stating that CAF Phase II support must be used "in areas substantially unserved by an unsubsidized competitor"); *Connect America Fund*, Report and Order, 29 FCC Rcd 15644 ¶ 73 (2014) ("any area served by an unsubsidized facilities-based terrestrial competitor that offers 10/1 Mbps will be ineligible for support in the Phase II competitive bidding process"); 47 C.F.R. § 54.5 (defining an "unsubsidized competitor" as a "facilities-based provider of residential fixed voice and broadband service that does not receive high-cost support").

24 *See, e.g., Western Wireless Corporation Petition for Preemption of Statutes and Rules Regarding the Kansas State Universal Service Fund Pursuant to Section 253 of the*

subsidization of a terrestrial competitor in a given area may discourage a satellite provider from incurring the substantial costs of deploying additional capacity to that area—thereby turning a market that may well have grown more competitive over time[25] into a market where the terrestrial provider is increasingly dominant.[26] This market distortion undermines the competitive forces that otherwise would drive down prices and encourage innovation and investment, and reduces consumer choice. Such distortions will only be exacerbated under the current RDOF proposal, which effectively precludes satellite providers from bidding for support, thereby handing an even more significant competitive advantage to terrestrial providers. And notably, allowing satellite providers to participate meaningfully in the auction would *not* cause

---

Communications Act of 1934, Memorandum Opinion and Order, 15 FCC Rcd 16227 ¶ 8 (2000) ("*Western Wireless Order*") ("A new entrant faces a substantial barrier to entry if its main competitor is receiving substantial support from the state government that is not available to the new entrant.").

25 *See, e.g.*, Paul Milgrom and Assaf Eilat, *The CAF Auction: Design Proposal*, at 18 (Jul. 25, 2011), https://milgrom.people.stanford.edu/sites/g/files/sbiybj4391/f/milgrom_eilat_auction_paper_july_25_2011.pdf (explaining that, in areas that are expensive to serve via terrestrial technology, satellite providers compete with each other and with wireless and terrestrial providers, as such providers are expanding and increasingly able to serve rural and remote areas); ViaSat Press Release, *One-Year Anniversary of Exede Service Satellite Internet Service Launch* (Mar. 18, 2013), *available at* https://www.viasat.com/news/one-year-anniversary-exede-satellite-internet-service-launch (noting that, of the 285,000 new subscribers Viasat added from March 2012 to March 2013, over 40% chose Viasat over available terrestrial competitors).

26 As the Milgrom/Auctionomics Report explains, contrary to the claims of those who oppose meaningful inclusion of satellite providers in the Commission's support mechanisms, the fact that satellite coverage "is in a certain sense already 'available' to any U.S. location" does not undermine the policy justifications for continuing to subsidize satellite services. Milgrom/Auctionomics Report at 6-7. "While the cost structures of satellite broadband providers and terrestrial providers differ, subsidies to satellite coverage will have similar, if not greater, public benefits to those to terrestrial coverage," given the substantial short-run and long-run impacts of subsidization on satellite providers' capacity allocation and network investment decisions. *Id.*

similar competitive distortions, because the presence of a terrestrial provider *is* considered in determining whether an area is "unserved" and therefore eligible for support.

For all these reasons, the Commission's proposal to substantially increase the latency penalty in a manner that would effectively preclude meaningful participation by GSO satellite providers in the RDOF auction is unsustainable as a policy matter. Such an approach would significantly reduce the number of supported locations by leaving behind those parts of the country where no terrestrial provider bids, substantially increase the average per-location subsidies in areas where terrestrial providers do bid, and distort competition by picking winners and losers in the broadband marketplace. If anything, the Commission should be seeking to *maximize* intermodal competition in its support mechanisms to drive efficient outcomes consistent with the goals of universal service—including by *reducing* the penalty on latency going forward.

II. THE PROPOSED LATENCY-RELATED PENALTY ALSO IS UNLAWFUL

A. Adopting the Proposed 40 Percent Latency Penalty Would Be Arbitrary and Capricious in Numerous Respects

In addition to the substantial policy problems set forth above, adopting the proposed 40 percent penalty for so-called "high-latency" bids would represent the height of "arbitrary and capricious" rulemaking under the Administrative Procedure Act ("APA"). As the D.C. Circuit recently reiterated, an agency's "obligation to engage in 'reasoned decisionmaking' means that '[n]ot only must an agency's decreed result be within the scope of its lawful authority, but the process by which it reaches that result must be logical and rational.'"[27] Thus, "the arbitrary and capricious standard demands that the agency 'examine the relevant data and articulate a

---

[27] *United Keetoowah Band of Cherokee Indians in Okla. v. FCC*, 933 F.3d 728, 738 (D.C. Cir. 2019) (quoting *Michigan v. EPA*, 135 S. Ct. 2699, 2706 (2015)).

satisfactory explanation for its action including a rational connection between the facts found and the choice made.'"[28] Under the APA, an agency action is arbitrary and capricious where the agency "failed to consider an important aspect of the problem" or "offered an explanation for its decision that runs counter to the evidence before the agency."[29] And as the Supreme Court has explained, reviewing courts must engage in a "thorough, probing, in-depth review" of agency decisions to determine whether they satisfy the APA's standards.[30]

For various reasons discussed below, there is not—nor could there be—any rational or evidence-based grounds for imposing a prohibitive 40 percent penalty on high-latency bids from GSO satellite operators. The NPRM certainly identifies no such grounds—a serious APA violation in and of itself.[31] Nor could the Commission—or private commenters seeking to impede satellite participation for their own competitive gains—develop any credible evidence that could support such a measure.

As an initial matter, as Viasat and various other parties have repeatedly explained, targeting latency with penalties comparable to those that apply to speed is highly questionable, particularly given the wide array of other relevant broadband characteristics that affect

---

28 *Id.* (quoting *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983)).

29 *Id.* (quoting *State Farm*, 463 U.S. at 43).

30 *Citizens to Pres. Overton Park, Inc. v. Volpe*, 401 U.S. 402, 415 (1971), *abrogated on other grounds by Califano v. Sanders*, 430 U.S. 99 (1977); *cf. Burlington Truck Lines, Inc. v. United States*, 371 U.S. 156, 167 (1962) ("[U]nless we make the requirements for administrative action strict and demanding, *expertise*, the strength of modern government, can become a monster which rules with no practical limits on its discretion.") (quotation marks omitted).

31 *See Solite Corp. v. EPA*, 952 F.2d 473, 484 (D.C. Cir. 1991) ("An agency commits serious procedural error when it fails to reveal portions of the technical basis for a proposed rule in time to allow for meaningful commentary.").

performance. The Commission's recent reports on the broadband marketplace confirm that the most important aspect of broadband performance for consumers—by far—is speed. For example, the Commission's *2018 Communications Marketplace Report* and *Eighth Measuring Broadband America Report* focus overwhelmingly on the speeds offered by ISPs in evaluating the robustness of the broadband marketplace and the comparative availability of services in areas across the country.[32] Academic studies likewise have long recognized that "[s]peed is the single most important metric of interest in characterizing the 'quality' of broadband service."[33] This marketplace reality also is reflected in the advertising strategies of leading broadband providers; even a cursory examination of the marketing materials of leading broadband providers shows that speed and price are the two most critical elements used to market service to the consumer.[34]

---

32 *See Communications Marketplace Report*, Report, 33 FCC Rcd 12558 ¶¶ 172-178 (2018) (*"2018 Communications Marketplace Report*") (focusing almost entirely on the speeds available for various types of fixed broadband services in describing available technologies, with minimal references to other service characteristics like latency); *id.* ¶¶ 179-191 (focusing *exclusively* on speed and coverage when describing intermodal competition in the marketplace); FCC, *Eighth Measuring Broadband America Report* (Dec. 14, 2018), https://www.fcc.gov/reports-research/reports/measuring-broadband-america/measuring-fixed-broadband-eighth-report ("*Eighth MBA Report*") (describing download and upload speeds as "the network performance metric of greatest interest to the consumer"); *see also* CONGRESSIONAL RESEARCH SERV., RL30719, BROADBAND INTERNET ACCESS AND THE DIGITAL DIVIDE: FEDERAL ASSISTANCE PROGRAMS 9 (2019), https://fas.org/sgp/crs/misc/RL30719.pdf ("[T]he FCC has set a minimum broadband speed that essentially serves as the benchmark the FCC uses to determine what it considers broadband service for the purposes of its Section 706 determination.").

33 Massachusetts Institute of Technology, Steve Bauer *et al.*, *Understanding Broadband Speed Measurements*, 2 (2010), *available at* https://www.measurementlab.net/publications/understanding-broadband-speed-measurements.pdf; *see also* Yu-Hsin Liu *et al.*, *Distinguishing Bandwidth and Latency in Households' Willingness-To-Pay for Broadband Internet Speed*, 45 INFORMATION ECONOMICS AND POLICY 1, 2 (2018) ("[C]onsumers value increasing bandwidth from 10 to 25 Mbps about three times more than they value reducing latency from satellite to wired levels.").

34 *See, e.g.,* AT&T, "Internet at Your Speed," https://www.att.com/internet/ (last visited Sep. 16, 2019) (advertising its residential fixed broadband offerings as delivering "[f]ast, consistent speeds" and providing a link to consumers with more information about

To be sure, other aspects of broadband service, including latency, jitter, and packet loss, can affect the performance of certain online applications.[35] But the Commission has never sufficiently justified singling out latency from among these other attributes and elevating it to the same level of importance as speed in establishing bidding penalties for federal support mechanisms. Indeed, among these other attributes of broadband performance, jitter and packet loss have at least as great (if not greater) impact than latency on the typical consumer's usage of broadband services.[36] Unlike latency, which affects only a very small subset of Internet applications (as discussed further below), both jitter and packet loss significantly impact the consumer experience, particularly with respect to streaming video—which represents far and away the greatest percentage of Internet traffic today.[37] Thus, absent penalties on other attributes of service like packet loss and jitter, it is highly questionable to single out latency for penalties to

---

AT&T's speed performance and pricing, without any mention of low latency); Verizon, "Verizon – Your High Speed Internet Service Provider," https://www.verizon.com/home/highspeedinternet/ (last visited Sep. 16, 2019) (advertising Verizon's "blazing-fast internet speeds" over its residential fixed broadband services, its rating of "#1 in speed" for "12 years in a row," and its pricing, as well as providing a test for consumers to determine whether their broadband services "measure[] up to Fios," without any details about the service's latency characteristics).

35 *See, e.g.,* Christopher S. Yoo, *Wireless Network Neutrality: Technological Challenges and Policy Implications*, 31 Berkeley Tech. L.J. 1409, 1436-37 (2016) (noting that in addition to speed, Internet service quality can be affected by reliability/packet loss, latency, and jitter, and that "applications vary widely in the types of quality of service they demand").

36 *See, e.g., id.* (explaining, for instance, that video streaming is particularly sensitive to jitter); *Eighth MBA Report* § I.C (noting that "[p]acket loss may affect the perceived quality of applications that do not request retransmission of lost packets," including "video streaming" applications). By contrast, "entertainment video streaming applications are tolerant of relatively high latencies." *Eighth MBA Report* § I.C.

37 *See* Sandvine, *Global Internet Phenomena Report*, at 6 (Oct. 2018), https://www.sandvine.com/hubfs/downloads/phenomena/2018-phenomena-report.pdf ("Sandvine Global Internet Phenomena Report") (finding that video streaming represents approximately 58 percent of all Internet download traffic).

essentially the same degree as different speed tiers—particularly when the Commission has adopted quality metrics for voice service, and has subjected GSO providers to a 750 ms round-trip, single-hop latency requirement.

Even if it were rational to penalize latency in the abstract, the proposed 40 percent penalty is arbitrary and capricious. To begin with, a prohibitive 40 percent penalty on latency would represent a clear reversal of Commission policy and therefore require a substantial justification in order to satisfy the APA. As noted above, until the issuance of the NPRM, the Commission had been taking steps to expand eligibility for federal high-cost support for broadband—including by moving from a categorical exclusion of satellite to allowing satellite participation subject to a 25 percent latency penalty.[38] But increasing the latency penalty to 40 percent, and effectively foreclosing meaningful participation by GSO satellite providers, would be a step in the opposite direction.[39]

Under controlling precedent, where an agency reverses course in this manner, "the APA requires an agency to provide more substantial justification when 'its new policy rests upon factual findings that contradict those which underlay its prior policy; or when its prior policy has

---

38 *See Connect America Fund*, Report and Order and Order on Reconsideration, 32 FCC Rcd 1624 ¶ 31 (2017) ("The Commission decided in the *Phase II Auction Order* to open the Phase II auction to participation from satellite providers 'in the interest of making this auction as competitive as possible.'") (quoting *Connect America Fund*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 5949 ¶ 33 (2016) ("*Phase II Auction Order*")).

39 Indeed, despite the NPRM's draconian penalties on satellite providers, Commissioner O'Rielly recognized in his statement the importance of satellite based providers to unserved areas, explaining that "[w]e simply cannot afford to exclude satellite-based providers, especially given the new and exciting possibilities satellite offerings can offer." NPRM, Statement of Commissioner Michael O'Rielly, at 60.

engendered serious reliance interests that must be taken into account.'"[40] As the Supreme Court has explained, if an agency departs from a previous policy, the "new policy must be permissible under the statute, and the agency must acknowledge it is changing its policy and show that 'there are good reasons' for the new policy and 'that the agency *believes* it to be better[.]'"[41] Put differently, "a reasoned explanation is needed for disregarding facts and circumstances that underlay or were engendered by the prior policy."[42]

The NPRM utterly fails to justify the FCC's policy reversal. In fact, the NPRM provides no reason—much less "good reasons"—for the departure from the FCC's prior policy of expanding opportunities for satellite providers in the CAF Phase II auction to effectively eliminating such opportunities in the RDOF auction.[43] A new 40 percent latency penalty would be unable to survive even ordinary arbitrary-and-capricious review, much less this heightened standard demanded by binding precedent.

Compounding the FCC's failure to justify its policy reversal is its failure to adequately explain or justify the proposed latency penalty itself. Most obviously, there is no rational relationship between the proposed 40 percent penalty on latency and the facts of actual Internet usage. According to the latest data from Sandvine on global Internet usage, the two applications

---

40 *Perez v. Mortg. Bankers Ass'n*, 135 S. Ct. 1199, 1209 (2015) (quoting *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 515 (2009)).

41 *Nat'l Lifeline Ass'n v. FCC*, 921 F.3d 1102, 1111 (D.C. Cir. 2019) (quoting *Fox Television Stations*, 556 U.S. at 515); *see also Fox Television Stations*, 556 U.S. at 515 (explaining that an agency may not "depart from a prior policy *sub silentio*" because it "would be arbitrary or capricious [for the agency] to ignore such matters").

42 *Fox Television Stations*, 556 U.S. at 516.

43 *Nat'l Lifeline Ass'n*, 921 F.3d at 1114 (holding that the FCC's adoption of a new requirement for a program was arbitrary and capricious because the FCC "depart[ed] from its prior . . . policy without reasoned explanation and fail[ed] to consider key aspects of the program").

most frequently cited as latency-sensitive—online gaming and VoIP communications—together make up less than 10 percent of Internet traffic.[44] And even that figure likely overstates the percentage of latency-sensitive traffic online. Sandvine's "gaming" category, which represents 7.78 percent of traffic, includes not only latency-sensitive real-time gaming applications but also non-latency-sensitive game download traffic.[45] Similarly, Sandvine's "messaging" category, which represents 1.72 percent of traffic, includes both VoIP and other forms of messaging that are not latency sensitive.[46] Moreover, any potential impact of latency on VoIP services is already mitigated by the Commission's requirement that "high-latency" bidders meet an MOS of four or better.[47] The evidence thus shows that *significantly less than 10 percent* of online traffic—and likely closer to *5 percent* of traffic—is even relevant for purposes of any potential latency-related penalty. The NPRM's proposed latency penalty of *40 percent* simply cannot be squared with this evidence. Instead, the evidence supports, at most, only a 5 percent latency-related weight.

The limited discussion of the 40 percent latency penalty in the NPRM only further underscores its arbitrariness. The NPRM attempts to justify the 40 percent penalty by pointing to a desire to maintain a combined 90 percent penalty for low-speed, high-latency services—apparently taking the view that, because the penalty for the lowest supported speed tier for RDOF will be reduced from 65 percent to 50 percent as compared with CAF II (as a result of the

---

44 *See* Sandvine Global Internet Phenomena Report at 6.

45 *See id.* ("Gaming traffic includes downloads from major gaming networks (PlayStation Network, Xbox Live, Steam, Nintendo, etc.) as well as traffic from specific games.").

46 *See id.* ("Messaging includes both VoIP as well as chat applications[.]").

47 *See generally Connect America Fund*, WC Docket No. 10-90, Order on Reconsideration, DA 19-911 (WCB, WTB, and OET rel. Sept. 12, 2019) (confirming that all high-latency support recipients must meet a MOS of four for their supported voice services).

elimination of the "minimum" 10/1 Mbps speed tier), the penalty for high latency should be increased from 25 percent to 40 percent, thus "maintain[ing] that same 90-point spread."[48] But there is no reason to believe that imposing an arbitrary 90-point spread is necessary—much less any reason to think that such an approach mandates increasing the latency penalty by 60 percent (i.e., from 25 percent to 40 percent). Nothing in the Commission's orders regarding the CAF Phase II auction—and certainly nothing in the NPRM—establishes that the 90-point spread has any particular, evidence-based significance. And even if there were some rational basis for thinking that a 90-point spread must be maintained, it is irrational to respond to the elimination of a *speed* tier by increasing the *latency* penalty. The obvious and far more reasonable response would be to reduce the overall spread in light of the elimination of a speed tier.

This sort of arbitrary line-drawing is precisely the type of scenario where courts refuse to defer to agency judgments. For example, in *Qwest Corp. v. FCC*, the Tenth Circuit struck down a benchmark percentage adopted by the Commission as part of its universal service program where the Commission had defended the chosen percentage as merely falling within a preexisting recommended range of options.[49] As the court explained, "[t]he FCC is not a mediator whose job is to pick the 'midpoint' of a range or to come to a 'reasonable compromise' among competing positions. As an expert agency, its job is to make rational and informed decisions on the record before it in order to achieve the principles set by Congress. Merely identifying some range and then picking a compromise figure is not rational decision-making."[50] The same is true here; the proposed 40 percent penalty is, at best, the result of picking an

---

48 NPRM ¶ 25.

49 258 F.3d 1191, 1202-03 (10th Cir. 2001).

50 *Id.* at 1202.

arbitrary number within a range—and, at worst, an irrational extension of the upper end of a previously utilized range—and thus would warrant no deference by a reviewing court.[51]

The NPRM also attempts to justify the adoption of the new latency penalty "in recognition that terrestrial fixed networks may serve as a backbone for 5G deployments."[52] But that rationalization amounts to a classic mismatch "between the facts found and the choice made."[53] The federal universal service program, which encompasses both CAF and RDOF, is designed principally to subsidize *retail* offerings to fixed locations, not the development and deployment of *wholesale* "backbone" services to support mobile service offerings.[54] The "universal service principles" set out in the Telecommunications Act of 1996 direct the Commission to establish polices aimed at providing and improving access to telecommunications services in rural areas, schools, health care facilities, and libraries by funding the carriers that can provide that retail access.[55] Similarly, the Commission has explained that the "universal service

---

51 *See also Nat. Res. Def. Council, Inc. v. EPA*, 966 F.2d 1292, 1306 (9th Cir. 1992) ("Without data supporting the expanded exemption, we owe no deference to EPA's line-drawing."); *AARP v. U.S. EEOC*, 267 F. Supp. 3d 14, 34, 37 (D.D.C. 2017) ("[The EEOC] has not adequately explained how it determined that the 30% incentive level is an adequate measure of voluntariness. Courts may not simply accept whatever conclusion an agency proffers merely because it is the agency's judgment. . . . [T]he agency must still point to some evidence in the record that reasonably supports where it chose to draw the line, and it must also respond to substantial criticisms of that choice. . . . '[D]eference' does not mean that courts act as a rubber stamp for agency policies." (quotation marks omitted)).

52 NPRM ¶ 25.

53 *United Keetoowah Band*, 933 F.3d at 738 (quoting *State Farm*, 463 U.S. at 43).

54 *See, e.g.*, *USF/ICC Transformation Order* ¶ 18 (recognizing the importance of providing "more predictable funding for carriers and [protecting] consumers and businesses that ultimately pay for the fund through fees on their communications bills").

55 *See* 47 U.S.C. §§ 214(e), 254(b); *see also* FCC, "Universal Service," https://www.fcc.gov/general/universal-service (last visited Sep. 16, 2019) ("The Act established principles for universal service that specifically focused on increasing access to evolving services for consumers living in rural and insular areas, and for consumers

challenge of our time is to ensure that all Americans are served by networks that support high-speed Internet access—in addition to basic voice service—where they live, work, and travel."[56] The Commission's statements and the Telecommunication Act's guiding principles make clear that the focus of universal service is expanding access to the American consumer and funding the carriers that provide that retail access—not the backbone providers that service those carriers.

B. The Proposed Penalty Violates the Legal Obligations To Ensure Competitive and Technological Neutrality in the Commission's Support Mechanisms

Additionally, the RDOF auction must be conducted in a manner that ensures competitive and technological neutrality—a guiding principle for the administration of the Commission's universal service support mechanisms. As noted above, subjecting GSO satellite providers to the proposed 40 percent latency penalty will effectively exclude GSO satellite providers like Viasat from competing in the RDOF auction, distorting competition and promoting terrestrial technologies over satellite technology.[57] Accordingly, the NPRM's proposed 40 percent latency penalty cannot be squared with the Commission's legal obligations to ensure competitive and technological neutrality.

In the *Universal Service First Report and Order*, the Commission adopted "competitive neutrality"—the goal of ensuring that "support mechanisms and rules neither unfairly advantage nor disadvantage one provider over another, and neither unfairly favor nor disfavor one

---

with low-incomes. Additional principles called for increased access to high-speed Internet in the nation's schools, libraries and rural health care facilities.").

56 *USF/ICC Transformation Order* ¶ 5; *see also id.* ¶ 10 ("The Communications Act directs the Commission to preserve and advance universal service: 'Access to advanced telecommunications and information services should be provided in all regions of the Nation.' It is the Commission's statutory obligation to maintain the USF consistent with that mandate and to continue to support the nation's telecommunications infrastructure in rural, insular, and high-cost areas.") (quoting 47 U.S.C. § 254(b)(2)).

57 *See supra* Section I.

technology over another"—as a guiding principle for the administration of support mechanisms under Section 254(b)(7).[58] The Commission has explained that "competitive neutrality in the . . . distribution of funds and determination of eligibility in universal service support mechanisms is consistent with congressional intent and necessary to promote a pro-competitive, de-regulatory national policy framework."[59] Rules that minimize competitive and technological bias "facilitate a market-based process whereby each user comes to be served by the most efficient technology and carrier"[60]—whereas the exclusion of a class of providers is not only inefficient but also "inconsistent with the language of the statute and the pro-competitive goals of the 1996 Act."[61] The Commission has specifically noted that "it is doubtful that a universal service funding program that restricts eligibility" in a manner that excludes competitive providers "could be considered competitively neutral."[62]

The NPRM's proposal to impose a 40 percent penalty on high-latency offerings abandons this important and binding principle. As explained above, such a penalty would effectively preclude meaningful participation by GSO satellite providers in the bidding process—by devaluing such providers' bids to so great a degree that there would be no reasonable prospect of prevailing over competing bids or even reaching the clearing round in the auction. There is no question that such an approach would significantly disadvantage GSO satellite providers vis-à-vis other providers and significantly disfavor GSO satellite technology vis-à-vis other

---

58 *See Federal-State Joint Board on Universal Service*, Report and Order, 12 FCC Rcd 8776 ¶ 47 (1997) ("*Universal Service First Report and Order*"); 47 U.S.C. § 254(b)(7).

59 *Id.* ¶ 48.

60 *Id.*

61 *Id.* ¶ 49.

62 *Western Wireless Order* ¶ 11.

technologies.[63] The 40 percent latency penalty would, in effect, operate as the sort of "wholesale exclusion of a class of carriers"—*i.e.*, GSO satellite providers—that the Commission has stated "would be inconsistent with the language of the statute and the pro-competitive goals of the 1996 Act."[64]

Moreover, such discrimination plainly would be unfair under the applicable legal standard.[65] As noted earlier, there is no evidentiary or reasoned basis for imposing a prohibitive 40 percent penalty in connection with a service's latency. Imposing a severe, baseless penalty on a service characteristic particular to one type of provider unfairly places such providers at a competitive disadvantage vis-à-vis other types of providers. The unfairness of the Commission's treatment of competitors is underscored by the magnitude of the unwarranted increase in the latency penalty. Increasing the latency penalty from 25 percent to 40 percent—particularly without any corresponding penalties for performance issues like jitter or packet loss—inappropriately burdens GSO satellite providers and confirms that the Commission would be "treating competitors differently in unfair ways."[66] Moreover, the increase in severity of the *latency* penalty is particularly telling and troubling based on the cause of the increase: the elimination of a *speed* tier. Because latency is a performance metric associated with GSO satellite providers, the proposed 40 percent latency penalty would unlawfully discriminate

---

63 *Universal Service First Report and Order* ¶ 47.

64 *Id.* ¶ 145.

65 *Id.* ¶ 47; *see also Rural Cellular Ass'n v. FCC*, 588 F.3d 1095, 1104 (D.C. Cir. 2009) (explaining that the principle of competitive neutrality "prohibits the Commission from treating competitors differently in 'unfair' ways").

66 *See Rural Cellular Ass'n*, 588 F.3d at 1104.

against GSO satellite providers and violate the universal service policy's guiding principle of competitive and technological neutrality.

III. THE COMMISSION SHOULD ENSURE THAT SATELLITE PROVIDERS CAN RELY ON HYBRID OFFERINGS AND SHOULD CONSIDER OTHER REFORMS TO INCREASE COVERAGE AND TRANSPARENCY

Beyond reconsidering its proposal to increase the latency penalty in the RDOF auction, the Commission should undertake additional measures to ensure that the auction framework fosters intermodal competition, maximizes the number of supported areas, and promotes efficiency. Such measures could include: (1) enabling providers to make effective use of "hybrid" bids that combine technologies in order to meet applicable public interest obligations, (2) adopting measures aimed at expanding coverage by supported services, and (3) increasing transparency in the bidding process while preventing collusive information-sharing practices.

A. The Commission Should Facilitate the Use of Hybrid Technologies

To begin with, the Commission should ensure that satellite providers can participate effectively in the RDOF auction by using hybrid technologies. As a general matter, the Commission has often indicated that it supports the practice of hybrid bidding.[67] At the same time, however, the Commission has imposed stringent restrictions on hybrid bids. Under the CAF Phase II auction rules and the current RDOF proposal, if a bid relies on an offering using hybrid technologies, that offering may qualify for a particular speed/latency tier only if it

---

[67] *See* NPRM ¶ 72 (proposing "allowing an applicant to use different technologies within a state and [to] use hybrid networks to meet its public interest obligations"); *see also, e.g.*, *Connect America Fund*, Public Notice, 33 FCC Rcd 1428 ¶ 64 n.133 (2018) ("*Auction 903 Procedures Public Notice*") ("An applicant may propose to use different technologies within a state and use hybrid networks to meet its Phase II public interest obligations.").

satisfies the applicable speed and latency requirements 95 percent of the time.[68] If a hybrid bid does not meet this 95 percent performance threshold, it is relegated to a lower tier with substantially higher bidding penalties. This ill-conceived approach greatly discourages GSO satellite providers from taking advantage of the flexibility afforded by hybrid technologies in bidding for support. In order to qualify for the low latency support tier, a "hybrid" plan developed by a GSO satellite provider would need to rely overwhelmingly on terrestrial technologies to meet the latency requirement.

Thus, in crafting the RDOF program, the Commission should carefully consider alternative approaches that would avoid inefficient results, promote intermodal competition, and ensure that all providers—including GSO satellite providers—can provide RDOF-supported locations with the benefits of hybrid technologies. For example, the Commission could consider modifying the 95 percent requirement such that, if a provider meets the MOS of four requirement for VoIP service and routes other latency-sensitive traffic over low-latency links that provide 100 ms of latency 95 percent of the time, it is deemed to satisfy the low latency threshold for bidding purposes.[69] Under this approach, speed testing would be performed over the hybrid network, not

---

68 *See Connect America Fund*, Report and Order, 28 FCC Rcd 15060 ¶¶ 23-27 (WCB 2013); *Auction 903 Procedures Public Notice*, 33 FCC Rcd 1428 ¶ 12 n.16 ("For the latency requirement, at least 95 percent or more of all peak period measurements of roundtrip latency must be at or below 100 milliseconds (ms) (low latency) or 750 ms (high latency)"); *Connect America Fund*, Order, 33 FCC Rcd 6509 ¶ 50 (2018).

69 The Commission's decision not to adopt this approach in connection with the CAF Phase II auction should not preclude consideration of it here. *See Phase II Auction Order*, 31 FCC Rcd 5949 ¶ 32. There, the Commission's rejection of the proposal was cursory and based solely on the unsupported notion that "[l]ow latency . . . is essential for most network-based applications. . . ." *Id.* Marketplace experience demonstrates that this is simply not the case; most notably, latency has little if any effect on streaming video, which makes up a substantial majority of Internet traffic today. *See* Sandvine Global Internet Phenomena Report at 6.

over any specific link, and the monthly usage threshold likewise would apply to the entire hybrid connection. Such an approach would enable GSO satellite operators to partner more effectively with terrestrial providers to dynamically route latency-sensitive traffic over low-latency terrestrial networks, while relying on satellite networks for other types of traffic.

Viasat is developing a hybrid solution that exemplifies the benefits of such offerings and ensures that each type of Internet traffic travels over a network path that is best suited for that traffic. Viasat's hybrid solution would begin by routing a customer's Internet traffic over a low-latency terrestrial link first, enabling an initial connection with minimal delay. As the user engages in Internet usage that demands more bandwidth and thus higher speeds, the network would automatically shift to utilizing the higher-speed satellite link to meet those performance demands and push larger amounts of data across that link more quickly than the low-latency terrestrial link may be able to accommodate on its own. For example, if the customer is simply browsing the web, the low-latency link generally would handle that traffic. However, if that customer then attempts to stream 4K video and thus demands more speed than the low-latency link can provide, the low-latency link would make only the initial connection to begin the stream with minimal delay, after which the high-speed satellite link would take over and deliver the remaining content to ensure the video does not require buffering beyond the initial connection. Moreover, latency-sensitive applications like real-time gaming would always be routed over the low-latency link, and to ensure peak performance for such applications, additional non-latency-sensitive traffic could be rerouted to the satellite link. This approach ensures an optimally efficient allocation of network resources based on customer usage and demand. Reforming the Commission's hybrid bidding rules along the lines proposed above would help accelerate the

availability of such innovative offerings in supported areas and stoke new forms of intermodal competition.

B. The Commission Should Consider Common-Sense Approaches for Maximizing Coverage by Supported Services

The Commission also should consider measures that would maximize the coverage given the RDOF budget. As the Milgrom/Auctionomics Report explains, one significant shortcoming of the CAF Phase II auction was its "fail[ure] to assign coverage to 27% (261,047) of the auctioned locations, while leaving unspent 25% ($49M) of the budget"—an outcome that has "created needless delay in delivering broadband internet to underserved areas."[70] One way to maximize coverage efficiently would be to use the budget freed up by competition among bidders in contested areas to assign support in CBGs where uncontested pre-clearing bids were made. Under this approach, "in each round after the clearing round," the Commission could "take advantage of savings from competition in contested areas to increase the clearing price point," thereby "allowing it to assign additional bids from earlier rounds."[71] The Milgrom/Auctionomics Report estimates that, if an approach such as this had been applied in the CAF Phase II auction, "it would have resulted in covering more than 210,000 additional locations, reducing the number of locations left unserved from 27% to just 4.7% of all the auctioned locations."[72] The Report also notes that such an approach would have the added benefit of "discourag[ing] bidders from engaging in . . . frivolous bidding in pre-clearing rounds," since "pre-clearing bids would then have a chance of winning."[73]

---

70 Milgrom/Auctionomics Report at 5.

71 *Id.* at 6.

72 *Id.*

73 *Id.*

Relatedly, the Commission could also consider a mechanism that would credit bidders for coverage in a manner that could offset penalties associated with speed and latency. As Dr. Milgrom has explained in prior submissions, a coverage credit would provide another input for the Commission to assess the total "quality" of a bid, and could mitigate the risk of reduced or unequal coverage by support recipients.[74]

C. The Commission Should Adopt Measures Aimed at Ensuring Appropriate Transparency in the Bidding Process

Finally, the Commission should consider ways to improve transparency and ensure that providers have enough information to bid efficiently. Multi-round auctions like CAF Phase II and RDOF produce the most efficient outcomes when they induce bidders to publicly reveal information about their intentions, thereby allowing all participants to develop more effective combinatorial bidding strategies as the auction progresses.[75] But in the CAF Phase II auction, loose eligibility and activity rules enabled some participants to engage in bidding tactics that significantly reduced transparency for other bidders—including by placing insincere bids in the pre-clearing rounds that, together, totaled more than the Commission's entire budget and covered a patently unrealistic number of CBGs.[76] As the Milgrom/Auctionomics Report explains, such bidding behavior "impede[s] meaningful information discovery before the clearing round" and "essentially convert[s] the clearing round into a sealed-bid auction."[77] To prevent such harmful

---

74 *See* Ex Parte Letter of John P. Janka, Counsel to Viasat, WC Docket Nos. 10-90, 14-58, 07-135, 05-337, 03-109, GN Docket No. 09-51, CC Docket Nos. 01-92, 96-45, WT Docket No. 10-208 (filed May 2, 2017) (attaching presentation from Dr. Milgrom addressing coverage credit proposal).

75 *See* Milgrom/Auctionomics Report at 4.

76 *See id.* at 4-5 (recounting a particularly egregious example of such conduct).

77 *Id.* at 4.

conduct in the RDOF auction, the Commission should consider adopting rules specifying that eligibility will be "determined separately for each individual area rather than on a state[wide] basis," and prohibiting participants from "placing bids for which the total support, evaluated at the round's base clock percentage, exceeds a predetermined share of the budget."[78]

At the same time, the Commission also should ensure that participants are not able to use bidding tactics to facilitate collusive sharing of non-public information in an effort to coordinate bids anticompetitively. Along these lines, the Commission could consider adopting a rule prohibiting bidders from "modifying their bids in rounds in which their implied supports for eligible services in eligible areas at base clock percentage do not change"—as such modifications may well represent attempts by bidders to "communicate for collusive purposes."[79] The need for thoughtful rules addressing anticompetitive exchanges of information is particularly pressing given ongoing enforcement proceedings stemming from collusive activities during the CAF Phase II auction.[80]

---

78 *Id.* at 5.

79 *Id.*

80 *See, e.g.*, *AT&T Services, Inc.*, File No. EB-IHD-19-00028991, Notice of Apparent Liability for Forfeiture, DA 19-785 (rel. Sep. 6, 2019); *AMG Technology Investment Group, LLC*, File No. EB-IHD-19-00028994, Notice of Apparent Liability for Forfeiture, DA 19-783 (rel. Sep. 6, 2019).

CONCLUSION

Viasat looks forward to working closely with the Commission to ensure that the RDOF auction is an unqualified success for American consumers. Through the modifications set forth above, the Commission will be able to expand the availability of robust broadband services throughout the country while driving down per-location costs—thus bridging the digital divide in an efficient, lawful, and competitively neutral manner.

Respectfully submitted,

/s/ John P. Janka

John P. Janka
Matthew T. Murchison
LATHAM & WATKINS LLP
555 Eleventh Street, NW
Suite 1000
Washington, DC 20004

Christopher Murphy
Associate General Counsel,
Regulatory Affairs
VIASAT, INC.
6155 El Camino Real
Carlsbad, CA 92009

September 20, 2019

EXHIBIT A

[Auction]omics

September 20, 2019

Lessons from the CAF II Auction for the RDOF Auction

1. Introduction

The FCC released an NPRM on August 1, 2019 concerning the Rural Digital Opportunity Fund (RDOF), in which a similar mechanism to the CAF II auction was proposed. The RDOF auction shares many features in common with the CAF II auction, such as the multi-round, descending clock auction format; but several notable changes were discussed, including tier and latency weights.

This paper is Auctionomics' response to the proposed rule changes in relation to Viasat, based on our analysis of the CAF II auction. We believe that Viasat played an important role in the success of the CAF II auction, both in providing competition for the auction and in committing to offer broadband service to a huge number of locations at a fraction of the total support. Increasing the tier and latency weights in the CAF II auction would have resulted in a strictly worse auction outcome for the public; hence we believe that it would not be in the public interest to increase the tier and latency weights in the RDOF auction.

In this paper, we also give suggestions for simple changes to the CAF II auction rules that would help avoid two problems observed in the CAF II auction: (i) impeded information discovery and (ii) leaving unspent nearly 25% of the budget in the CAF II auction, thereby delaying the provision of broadband service to underserved areas. Finally, we explain why we believe that subsidizing broadband coverage in underserved areas will entail significant public benefits.

We will be happy to discuss our analysis in detail with the Commission's staff.

2. Viasat's Role in the CAF II Auction

The success of the CAF II auction was due in large part to Viasat's participation. Indeed, Viasat committed to offer broadband service to 190,595 locations — 27% of all the locations covered in the auction — for just 8.2% of the awarded support. Viasat's average per-location subsidy was only 25% of that awarded to terrestrial providers.

Auctionomics Inc.
677 Waverly Street
Palo Alto, CA 94301

PHONE (650) 723-3397
E-MAIL paul@auctionomics.com
WEB SITE http://www.auctionomics.com

The importance of Viasat's participation to the CAF II auction is best seen by examining what the auction results would have been had Viasat not participated.[1] In this counterfactual, the auction would still have cleared in round 12, albeit at a price point of 79.5% instead of 78.35%. This higher clearing price point would have allowed terrestrial providers to cover at most 43 additional CBGs, containing 2,548 locations, which is just 0.48% of the total of 522,581 locations covered by terrestrial providers in the auction.[2] This marginal displacement of terrestrial coverage by Viasat should be contrasted with the 36% coverage increase due to Viasat's participation.[3] Thus, Viasat covered 75 new locations for each location whose terrestrial coverage it displaced.

Furthermore, the coverage increase due to Viasat's participation had a zero net cost to the FCC. Indeed, had Viasat not participated, clearing would have still occurred in round 12 with essentially the same assigned support,[4] and the auction would have proceeded to reduce the cost in subsequent rounds in exactly the same way. Thus, the support awarded to Viasat was offset by the reduction in the support awarded to terrestrial bidders. Furthermore, only 8% of that amount (namely, $990K) was demanded by terrestrial providers to cover the 43 additional CBGs they bid for,[5] with the remaining 92% coming out of the rents demanded by monopolistic terrestrial bidders for the locations they ended up covering anyway.

Thus, the effect of Viasat's participation was to supply broadband service to a large number of locations that otherwise would have been left unserved, while providing competition to monopolistic terrestrial providers and reducing their rents, with only a tiny reduction in terrestrial coverage, and at zero net cost to the FCC.

3. Performance Tier and Latency Weights

The outcome of the CAF II auction was highly dependent on the specific performance tier and latency (T+L) weights used by FCC. With the weights used in the auction, Viasat's implied support went to zero in the clearing round, and the implied support awarded to Viasat was within 8.35% of the reserve support.

---

[1] We performed this counterfactual analysis using the CAF II bid data available from the CAF II Public Reporting System, https://auctiondata.fcc.gov/public/projects/auction903.

[2] These are the CBGs that received terrestrial bids in round 12 at price points above 78.35% but not above 79.5%; however, not all of these CBGs would have received coverage since the package bid at 75% would have been only partially assigned using pseudo-random tie-breaking.

[3] Of the 190,595 locations covered by Viasat, only 26 would have had coverage if Viasat did not participate, so 190,569 additional locations were covered due to Viasat's participation

[4] While we are unable to calculate the exact assigned support in the counterfactual without knowing the exact tie-breaking algorithm used by the FCC, we found that the effect of Viasat's participation on the assigned support would have been no more than $48K, since a budget surplus in excess of that amount would have allowed FCC to assign an additional CBG bid at 79.5% in round 12.

[5] This is the total implied support demanded in round 12 by terrestrial provider' bids at price points above 78.35% but not above 79.5%.

To better understand the effects of the T+L weights on the auction's outcome, we considered CAF II counterfactuals in which Viasat's penalty was higher or lower than that used in the auction. While a higher penalty would have resulted in dramatically lower coverage with no change in the cost, a lower penalty would have produced substantially greater coverage at a lower cost. We outline our analysis below.

First, we considered the counterfactual in which Viasat's T+L weight is 10% percent higher (corresponding to increasing the latency weight to 35% while keeping the service tier weights unchanged). In this scenario, Viasat's support would have been reduced to zero before round 12, preventing Viasat from winning any areas or to offering any competition to terrestrial providers. Thus, Viasat would have been unable to influence the auction's outcome, resulting in a large number of locations losing coverage, with only a tiny number of locations gaining terrestrial coverage, and with no change to the auction's overall cost.

Second, we considered the counterfactual in which Viasat's penalty is 8% lower (corresponding to reducing the latency weight to 17% while keeping the tier service weights unchanged).[6] We assumed that Viasat bids straightforwardly based on its costs, so that the 8% penalty reduction would have induced Viasat to bid 8% lower price points for all areas. In this scenario, the auction would still have cleared in round 12, making 469,586 additional locations available for bidding in round 13, for a total of 797,278 locations, which is a 14% increase relative to the corresponding total of 701,723 locations in the actual auction. While it is impossible to know exactly how bidding would have proceeded in round 13, we estimate that about 488,000 locations would have received terrestrial coverage and 309,000 locations would have received coverage from Viasat.[7] In addition, stronger competition from Viasat would have reduced the auction's cost by $17M, out of which $10M would have come out of reduced payments to terrestrial providers for the same coverage and $7M from replacing some terrestrial coverage with Viasat's coverage. Thus, the likely outcome of the lower latency penalty would have been a 16% increase in total coverage due to Viasat's coverage of 118,000 locations, with a terrestrial coverage decrease of only 35,000 locations (a 7% decrease), and a $17M reduction in the aggregate cost.

While a latency penalty is supposed to reflect public preference for low-latency internet services, our analysis demonstrates that it is a very blunt tool for expressing the policy

[6] We chose the penalty reduction to be 8% because it is the largest integer reduction that would have still produced clearing in round 12, allowing our counterfactual to utilize bids submitted in round 12. With a lower penalty, clearing would have been delayed, requiring us to extrapolate the bidding on areas that in reality did not receive any bids in round 13 because they were assigned in round 12. While such extrapolation would have been more speculative, we expect that it would have produced similar results.

[7] The estimates in this paragraph are based on (a) terrestrial bids submitted in round 12 in the actual auction, (b) terrestrial bids for contested areas in round 13, and (c) the assumption that bidders for uncontested areas in round 13 would have bid similarly to the bidders for contested areas if the areas were contested by Viasat.

trade-off between GSO and terrestrial services, and that it has a dramatic and asymmetric effect on the auction's outcome. Making the latency penalty more draconian than that used in the CAF II auction will create a very high risk if not certainty of eliminating any potential competition from GSO satellite providers, resulting in significantly reduced coverage and a much higher per-location subsidy. Based on our CAF II auction calculations, a policy maker who prefers GSO coverage of 75 locations to terrestrial coverage of a single location would not have wanted the CAF II auction to use a higher latency penalty. On the other hand, reducing the latency penalty is likely to increase overall coverage, yield only a small reduction in terrestrial coverage, and reduce the auction's overall cost due to more robust competition. Our CAF II auction calculations show that a policy maker who prefers GSO coverage of 3.4 locations to terrestrial coverage of a single location would have preferred the CAF II auction to use a *lower* latency penalty.

Thus, ***economic considerations militate against setting the latency weight any higher than it was in the CAF II auction, and indeed support setting a lower latency weight than in the CAF II auction***.

4. Eligibility and Activity Rules

The primary benefit of a multi-round auction format is that it induces bidders to reveal their intentions, enabling bidders with value dependencies (such as scale economies or capacity constraints) to focus their bidding on combinations that they have a reasonable chance of winning at acceptable prices. However, bidders only have an incentive to reveal their intentions by sincere bidding when their bids have a chance of winning. This was not the case in the pre-clearing rounds of the CAF II auction, in which any meaningful information discovery was inhibited by excessively loose eligibility and activity rules.

Indeed, CAF II auction bidders were allowed to bid in all areas of a state that they were qualified to bid in, even if they could realistically serve only a small number of these areas. One bidder, Wisper ISP, took advantage of this in an extreme way. Specifically, in every round before round 12, Wisper ISP bid for a support amount (at the base clock percentage) in excess of FCC's $198M budget, eliminating any chance that its bids could win. In round 11 (the last pre-clearing round), Wisper ISP bid for over 16,000 CBGs (i.e., more than half of the CBGs in the auction), for a total of $210M in support. In round 12, Wisper ISP allowed clearing by shrinking its bid to just 1,392 CBGs, for a total support of $31M. Thus, in the last pre-clearing round Wisper ISP bid on 11.9 times the number of CBGs it intended to serve, demanding 6.7 times the support it actually needed to serve them. Clearly, Wisper ISP knew that its pre-clearing bids could not possibly win, and that they were not needed to maintain eligibility for the areas it did intend to win, so Wisper ISP's intent appears to be single-handedly preventing clearing and impeding meaningful information discovery before the clearing round. This bidding behavior essentially converted the clearing round into a sealed-bid auction, creating high uncertainty for

other bidders about which areas they could potentially win and made it impossible for them to plan effective combinatorial bidding strategies for a large number of areas.

A remedy to this problem would be an approach where ***eligibility in the RDOF auction is determined separately for each individual area rather than on a state basis,*** so that bidders are not allowed to bid for areas in which they are unable to provide service. In addition, the RDOF auction could ***prohibit bidders from placing bids for which the total support, evaluated at the round's base clock percentage, exceeds a predetermined share of the budget (say, 80%).*** The latter approach would ensure that each bid has at least some chance of winning, which would discourage insincere bidding on a large scale.[8]

Further impediments to productive information discovery in the CAF II auction were activity rules that allowed bidders to change their bids in rounds in which their prices did not change at all, as was the case for terrestrial bidders in most of the pre-clearing rounds. Since a bidder whose prices do not change has no sincere reason to change its bids, we believe that most pre-clearing movements by terrestrial bidders were attempts to communicate for collusive purposes, which obfuscated any productive information discovery. In this regard, the RDOF auction could ***prohibit bidders from modifying their bids in rounds in which their implied supports for eligible services in eligible areas at base clock percentage do not change. This can be implemented by allowing a bidder's first-round bid to specify only price points below 100% plus the maximal T+L weights for the bidder's eligible services in eligible areas, and not allowing the bidder to modify the initial bid or submit new bids until the base clock percentage falls below that number.***

The approaches set forth above will encourage sincere bidding in the early rounds and allow information discovery, discourage market manipulation and collusion, and result in wider and more efficient broadband coverage.

5. Maximizing Coverage given the Budget

One reason the CAF II auction was not as successful as it could have been is that it failed to assign coverage to 27% (261,047) of the auctioned locations, while leaving unspent 25% ($49M) of the budget. This created needless delay in delivering broadband internet to underserved areas. Yet a simple modification to the rules would have allowed the auction to use the whole budget to maximize coverage. Namely, note that when calculating the clearing point *within the clearing round*, the CAF II auction used the savings from competition in contested areas to assign additional uncontested bids until

[8] Note that an analogy to submitting bids that have no chance of winning in the traditional selling auction would be bidding for more than the available supply of some product, and that such bids are usually prohibited.

the budget is nearly exhausted. This logic can be extended across rounds to maximize coverage.

Specifically, a simple way to do so is ***for the FCC to take advantage of savings from competition in contested areas to increase the clearing price point, in each round after the clearing round, allowing it to assign additional bids from earlier rounds***. The FCC could do so using the same algorithm as the one used in the clearing round of the CAF II auction, except that the clearing point would be allowed to exceed the pre-clearing round's base clock percentage and therefore bids from earlier rounds could then be assigned. This would allow the FCC to assign uncontested pre-clearing bids using the budget freed up by competition in contested areas.[9]

We calculated that had this rule be applied in the CAF II auction, it would have resulted in covering more than 210,000 additional locations, reducing the number of locations left unserved from 27% to just 4.7% of all the auctioned locations.

Not only would this modification allow the auction to maximize coverage, it would also minimize bidders' opportunities to manipulate the auction. Indeed, it would discourage bidders from engaging in the kind of frivolous bidding in pre-clearing rounds that we discussed in section 4 above, since pre-clearing bids would then have a chance of winning. Thus, this modification would both promote information discovery in early rounds and enable a more efficient allocation.

6. Public Benefit of Subsidizing Satellite Broadband Coverage

Those who oppose meaningful inclusion of satellite providers in the Commission's support mechanisms frequently argue that subsidies to satellite broadband coverage have no public benefit because this coverage is in a certain sense already "available" to any U.S. location, while, in contrast, expansion of terrestrial coverage to new locations requires substantial investments. However, this argument is based on a misunderstanding of the economics of the broadband market. While the cost structures of satellite broadband providers and terrestrial providers differ, subsidies to satellite coverage will have similar, if not greater, public benefits to those to terrestrial coverage.

Even though a satellite provider may be able to provide service to any U.S. location on a short time frame, this is only possible by diverting some of its limited orbital capacity from more profitable uses. Thus, the satellite provider's short-run cost of adding coverage is the "opportunity cost" of capacity. The short-run public benefit of

[9] To accommodate bidders who do not wish their bids on different areas in different rounds to win at the same time, when assigning an earlier bid the FCC may permit the bidder to withdraw from any areas not contained in that bid in the next round. In that case, FCC should assign a bid from an earlier round only if this would increase the overall number of locations covered even upon such withdrawal.

subsidizing satellite coverage of underserved areas is that it induces the providers to shift their capacity from uses that are privately profitable (such as providing market-price services, lower-bandwidth services, and/or services in areas with existing alternative broadband providers) to uses with greater public benefits (providing affordable high-bandwidth services in areas where no alternative broadband providers exist).

Furthermore, in the long run, satellite broadband subsidies would incentivize satellite providers to increase their orbital capacity by accelerating the launches of new satellites and/or increasing the capacity of those satellites. This benefit will not be unlike that of subsidies encouraging terrestrial providers to expand their existing coverage areas. However, while terrestrial coverage expansion is likely to be restricted to areas that are close enough to urban centers, satellite capacity expansion has the potential of bringing affordable broadband coverage to every location in the country, and at a drastically lower per-location subsidy.

Paul Milgrom

Ilya Segal